## AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph at page 2, lines 4-8, with the following amended paragraph:

This application claims the benefit of U.S. Provisional Application No. 60/472,447, filed May 20, 2003, which is incorporated herein by reference. This application is related to ~~SD7276, "Spectral Compression Algorithms for the Analysis of Very Large Multivariate Images,"~~ U. S. Patent Application No. 10/772,548, filed of even date with this application.

Please replace the paragraph at page 36, lines 18-23, with the following amended paragraph:

The present invention is directed to spatial compression algorithms, described below. The spatial compression algorithms can be combined with the spectral compression algorithms, described above, that are the subject of the related ~~patent application SD7276, "Spectral Compression Algorithms for the Analysis of Very Large Multivariate Images",~~ U. S. Patent Application No. 10/772,548, to provide additional computational efficiencies in the analysis of large, high resolution full-spectrum images.

Please replace the paragraph at page 15, lines 16-26, with the following amended paragraph:

If the data matrix **D** is weighted, the test for convergence of the constrained ALS solution is:

$$\min\left\| \mathbf{GDH} - \mathbf{GCS}^{\mathrm{T}}\mathbf{H} \right\|_{\mathrm{F}} = \min\left\| \breve{\mathbf{D}} - \breve{\mathbf{C}}\breve{\mathbf{S}}^{\mathrm{T}} \right\|_{\mathrm{F}} \tag{6}$$

where $\breve{\mathbf{D}}$ is the weighted data matrix, $\breve{\mathbf{C}} = \mathbf{GC}$ is the weighted concentration matrix, and $\breve{\mathbf{S}}^{\mathrm{T}} = \mathbf{S}^{\mathrm{T}}\mathbf{H}$ is the weighted spectral shapes matrix. Eq. (6) can be solved with appropriate constraints applied to $\breve{\mathbf{C}}$ and $\breve{\mathbf{S}}^{\mathrm{T}}$, as described above. After estimating the weighted concentrations and spectra, the corresponding unweighted concentrations and spectra can be recovered as $\cancel{\mathbf{C} = \breve{\mathbf{C}}\mathbf{G}^{-1}}$ $\mathbf{C} = \mathbf{G}^{-1}\breve{\mathbf{C}}$ and $\mathbf{S}^{\mathrm{T}} = \breve{\mathbf{S}}^{\mathrm{T}}\mathbf{H}^{-1}$. For simplicity, the analysis of the unweighted data matrix **D** will

be described hereinafter, although it will be understood that the method of the present invention can also be applied to the weighted data matrix $\breve{\mathbf{D}}$.